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## YIELDS OF REGISTERED AND GRADE COWS 1/

This publication contains lactation averages for milk yields (lb.), fat percentages, and fat yields (lb.) of registered and grade cows by breed and year of calving for the years 1954-1969.

Differences between registered and grade cows whose sire's and dam's breeds were identified and similar are also shown. These differences were computed in two ways. The first was the mean difference of all grade and registered lactations, ignoring herds. The second was a within-herd difference that was accumulated across herds with proper weighting 2/ for its reliability in an individual herd.

All lactation averages and other data shown have been standardized to a twice-a-day milking (2x), 305-day lactation length, mature equivalent (M.E.) basis.

Lactation averages for registered and grade cows for the years 1965, 1966, 1967, 1968, and 1969 are being reported for the first time. Lactation averages for grade and registered cows for the years 1956 through 1964 have been previously reported in the following publications:

ARS 44-82, September 1960; ARS 44-104, August 1961; ARS 44-105, August 1961; ARS 44-143, May 1964; ARS 44-147, June 1964; ARS 44-161, June 1965; and ARS 44-181, June 1966.

However, the breed-year averages in the current publication may differ slightly from previous lactation averages

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1/ Prepared by B. T. McDaniel and F. N. Dickinson with the technical assistance of A. H. Kienast, the data processing staff of Dairy Herd Improvement, and J. J. Corbin.

2/ The difference in each individual herd-year was weighted by:

$$\frac{(\text{Number of registered lactations}) \times (\text{Number of grade lactations})}{(\text{Number of registered lactations}) + (\text{Number of grade lactations})}$$

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because of the more appropriate adjustment factors used in these computations.

Within-herd differences between registered and grade cows have not been previously reported.

Records included in averages.--Only Official DHI records <sup>3/</sup> that passed USDA editing procedures described in the December 1970 Dairy-Herd-Improvement Letter, ARS 44-222, were included in the averages. Cows were not included if the breed of sire and breed of dam were different. Records of cows with unknown sires or dams were included in the "all grades" averages.

For instance, a cow reported as a Brown Swiss (breed 5) would not have been included if her dam was coded as another breed. However, if the cow's sire or dam had been reported as breed 0, unknown, the cow would have been included in the "all grades" averages for Brown Swiss cows.

How records were standardized to a 2x, 305-day, M.E. basis.--Lactations where cows were denied an opportunity to milk 305 days were projected to a 305-day basis with factors that account for differences in lactation curves by breed, age, and the two yield traits--milk and fat. These factors are currently used by USDA and were published in the August 1965 Dairy-Herd-Improvement Letter, ARS 44-164.

All lactations were adjusted to a mature equivalent (M.E.) basis by the age adjustment factors currently in use by USDA. These account for variation due to breed, season, region, and the two yield traits--milk and fat. The factors used were published in the February 1967 Dairy-Herd-Improvement Letter, ARS 44-188.

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<sup>3/</sup> DHIR records are included since they are also Official DHI records.

Lactations made on three- or four-times-a-day milking were reduced to a two-times-a-day (2x) basis with factors published in ARS 52-1 (Kendrick, 1955) 4/.

Fat percentages were computed from the 2x, 305-day, M.E. milk and fat yields, which put them on the same basis.

Tables of averages and numbers of records, by breed, year, and type.--The number of Official DHI lactation records available for registered cows, all grade cows, and the grade cows with complete identification for each year of calving, and their respective 2x, 305-day, M.E. averages for lactation milk yields, fat percentages, and fat yields are presented separately for each breed in tables 1 through 5.

Averages for Ayrshires are in table 1. For example, they show that in 1969, there were 18,420 Official DHI lactation records of registered Ayrshire cows that passed USDA edits. These lactation records averaged 11,558 pounds of milk, 3.90 percent fat, and 451 pounds of milk fat on a 2x, 305-day, M.E. basis. All of the 5,135 grade cows calving in 1969 averaged 10,902 pounds of milk, 3.83 percent fat, and 417 pounds of fat. Both sire and dam were identified for 1,377 of the grade cows, and these grades yielded 11,152 pounds of milk, 3.88 percent fat, and 433 pounds of fat.

Data in tables 1 to 5 show that all registered cows outyielded all grade cows for milk in all breeds and years. Registered superiority was most evident in Holsteins and Guernseys, particularly in later years. It is not clear how much of the difference between grade and registered cows is genetic and how much is due to feeding and management, since these two types of cows tend somewhat to be in different herds.

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4/ Kendrick, J. F. Standardizing Dairy Herd Improvement Association Records in Proving Sires. U.S. Dept. of Agriculture, Agricultural Research Service. ARS 52-1, 1955.

Grades whose parents are identified generally had higher milk yields than the average of all grades. It is not clear how much these differences reflect genetic superiority or better feeding and management, as these cows with identified parents and these without identified parents were not always in the same herds. The within-herd differences between grades with parental identification (ID) and other grades were small and variable except in Holsteins where they were consistently 100-200 pounds in favor of grades with parental ID (McDaniel, unpublished data). These results suggest that grade cows with known parents are somewhat genetically superior to those whose parents are unknown.

Differences between grade cows with complete parental identification and registered cows.--These comparisons are presented by breed and year in tables 6 through 10. Only grades with both parents positively identified and of the same breed were used to eliminate possible crossbreds that may have been reported without sires and dams.

Data for Ayrshires in table 6 show that across herds, registered cows exceed grades by 256 to 867 pounds of milk, with the larger differences in the 1950's. Within-herd differences were much lower, and some were actually negative in the late 1960's, indicating that within a herd, grades were outyielding their registered herdmates. The same pattern held for fat yield, but fat percentages differed little between the two groups.

Grade-registered differences for milk and fat yields in all other breeds followed a pattern generally similar to that of the Ayrshires--clear superiority in yield for registered cows in the 1950's with an erosion that had grades outyielding their registered herdmates by the late 1960's. Registered Guernseys, Jerseys, and Brown Swiss had higher fat percentages than their grade herdmates, while registered Holsteins tested lower.

The numbers of herds having both registered and grade cows is large enough to give quite a high probability that the observed within-herd differences are real and not the result of sampling. Since registered bulls were used almost exclusively in herds having both registered and grade cattle, the role of purebred breeders in the improvement of the grade cow population should be recognized.

These results suggest that herds having both registered and grade cows, which are the only ones contributing to the within-herd difference, have somewhat different selection goals for the two groups. Among cows with similar yields, grades are probably culled before registered cows with the same production, which would cause surviving grades to be higher producers. Also, more selection for body-type characteristics may have taken place in the registered cows.

Some might argue that herds that are entirely registered are genetically superior to herds composed completely of grade cows. We did not have any way of testing this directly. However, it does not seem that such a situation could have influenced these results very much, since the all-registered herds would likely have been the ones breeding most of the bulls used in mixed grade and registered herds. Also, the breeding policies in the entirely registered herds and registered cows in the mixed herds were likely to be quite similar.

These results show the value of grade cows in breeding, and suggest that the recently-adopted policy of some breed associations of accepting some high-quality grade cows was wise and could result in breeding improvement.

TABLE 1 --Averages for all registered and grade Ayrshire cows, by year, on a 2x, 305-day, M.E. basis

Year of calving	Number of records			Milk yield			Fat percentages			Fat yield		
	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades
	No.	No.	No.	Lb.	Lb.	Lb.	%	%	%	Lb.	Lb.	Lb.
1954	10,778	184	1,279	9,258	8,735	9,062	3.97	3.95	3.95	368	345	358
1955	11,388	243	1,386	9,355	8,643	9,153	3.99	3.99	3.95	373	345	362
1956	11,317	259	1,280	9,605	8,795	9,024	3.98	3.95	3.93	383	348	355
1957	12,682	408	1,502	9,685	8,884	9,075	3.98	4.00	3.93	386	355	357
1958	13,962	539	1,883	9,761	8,894	8,973	3.99	4.02	3.94	389	357	354
1959	14,185	709	2,580	9,717	9,090	9,079	3.96	4.01	3.92	385	364	356
1960	15,911	842	3,258	9,840	9,373	9,133	3.97	3.97	3.90	391	372	357
1961	16,507	1,002	4,127	10,036	9,500	9,242	3.96	3.95	3.90	397	376	360
1962	19,353	1,308	4,670	10,302	9,990	9,582	3.95	3.95	3.89	407	395	373
1963	19,357	1,464	4,943	10,583	10,243	9,858	3.95	3.93	3.89	418	403	384
1964	20,042	1,559	5,566	10,845	10,447	10,148	3.95	3.94	3.88	429	411	394
1965	19,825	1,662	5,828	10,896	10,640	10,250	3.94	3.94	3.87	429	420	397
1966	19,041	1,593	5,348	11,075	10,649	10,442	3.94	3.94	3.87	437	420	404
1967	19,120	1,568	5,527	11,127	10,703	10,591	3.93	3.93	3.85	437	420	408
1968	18,471	1,550	5,332	11,356	10,871	10,742	3.91	3.89	3.84	444	423	412
1969	18,420	1,377	5,135	11,558	11,152	10,902	3.90	3.88	3.83	451	433	417

<sup>1/</sup> Breed of sire and breed of dam reported as Ayrshire.

TABLE 2 --Averages for all registered and grade Guernsey cows, by year, on a 2x, 305-day, M.E. basis

Year of calving	Number of records			Milk yield			Fat percentages			Fat yield		
	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades
	No.	No.	No.	Lb.	Lb.	Lb.	%	%	%	Lb.	Lb.	Lb.
1954	47,986	2,667	23,004	8,233	7,723	7,964	4.74	4.67	4.62	391	361	368
1955	48,636	2,934	22,958	8,327	8,004	8,077	4.74	4.71	4.63	395	377	374
1956	50,437	3,304	20,757	8,486	8,122	8,147	4.74	4.68	4.62	402	380	377
1957	58,582	4,824	20,981	8,509	8,193	8,178	4.75	4.68	4.62	404	383	378
1958	62,856	6,794	23,317	8,651	8,346	8,247	4.74	4.69	4.61	410	391	380
1959	68,535	8,998	29,298	8,708	8,384	8,256	4.73	4.69	4.59	412	393	379
1960	73,867	10,168	33,856	8,724	8,450	8,255	4.74	4.70	4.60	414	397	380
1961	75,663	11,190	38,020	8,896	8,638	8,363	4.74	4.71	4.59	422	407	384
1962	87,110	13,016	41,019	9,089	8,828	8,482	4.75	4.70	4.59	431	415	389
1963	86,301	12,783	41,268	9,279	9,002	8,671	4.75	4.69	4.59	440	422	398
1964	86,440	12,525	44,427	9,419	9,136	8,798	4.73	4.68	4.57	446	427	402
1965	82,986	11,645	43,696	9,512	9,151	8,847	4.71	4.67	4.56	448	428	403
1966	80,357	10,890	40,295	9,639	9,409	9,071	4.71	4.66	4.55	454	439	413
1967	77,842	10,782	39,658	9,711	9,539	9,237	4.69	4.64	4.55	456	443	421
1968	73,813	10,703	38,333	9,882	9,708	9,384	4.68	4.61	4.54	462	448	426
1969	68,770	10,609	35,306	10,117	9,833	9,591	4.66	4.60	4.53	472	452	435

<sup>1/</sup> Breed of sire and breed of dam reported as Guernsey.

TABLE 3 --Averages for all registered and grade Holstein cows, by year, on a 2x, 305-day, M.E. basis

Year of calving	Number of records			Milk yield			Fat percentages			Fat yield		
	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades	Regis-tered	Grades with ID <sup>1/</sup>	All grades
	No.	No.	No.	Lb.	Lb.	Lb.	%	%	%	Lb.	Lb.	Lb.
1954	128,218	11,432	89,685	12,264	11,418	11,308	3.57	3.57	3.56	438	408	403
1955	139,978	13,331	98,875	12,426	11,657	11,478	3.59	3.59	3.57	446	418	410
1956	143,366	17,450	105,589	12,538	11,910	11,643	3.60	3.60	3.58	452	429	417
1957	170,081	28,128	123,595	12,646	12,082	11,702	3.62	3.61	3.59	457	437	421
1958	198,643	44,054	143,794	12,883	12,408	11,959	3.62	3.61	3.59	466	448	430
1959	233,390	64,605	182,618	12,876	12,424	11,987	3.63	3.63	3.60	467	451	432
1960	252,138	81,839	294,093	12,996	12,580	12,018	3.63	3.62	3.60	472	456	433
1961	269,825	103,011	397,943	13,291	12,843	12,166	3.63	3.63	3.59	482	466	437
1962	343,779	138,892	478,339	13,673	13,145	12,445	3.63	3.63	3.59	496	477	447
1963	373,595	157,828	575,646	13,996	13,542	12,884	3.63	3.62	3.59	508	491	462
1964	403,079	181,654	735,296	14,263	13,800	13,191	3.63	3.63	3.59	517	500	473
1965	413,408	198,126	808,561	14,340	13,819	13,223	3.63	3.63	3.59	520	501	475
1966	418,849	206,354	827,732	14,489	14,014	13,437	3.64	3.64	3.60	527	510	483
1967	430,718	223,488	895,178	14,460	14,108	13,556	3.64	3.63	3.59	526	512	487
1968	437,302	240,987	950,435	14,663	14,286	13,742	3.63	3.63	3.59	533	519	494
1969	435,542	255,826	970,407	14,912	14,565	13,993	3.63	3.63	3.59	542	528	503

<sup>1/</sup> Breed of sire and breed of dam reported as Holstein.

TABLE 4 --Averages for all registered and grade Jersey cows, by year, on a 2x, 305-day, M.E. basis

Year of calving	Number of records			Milk yield			Fat percentages			Fat yield		
	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades
	No.	No.	No.	Lb.	Lb.	Lb.	%	%	%	Lb.	Lb.	Lb.
1954	31,317	1,497	6,294	7,895	7,599	7,732	5.21	5.12	5.11	411	389	395
1955	32,287	1,718	6,300	7,946	7,749	7,808	5.21	5.14	5.11	414	399	399
1956	33,194	2,109	5,998	8,058	7,809	7,876	5.19	5.14	5.10	418	401	401
1957	36,737	3,167	6,313	7,998	7,884	7,918	5.18	5.12	5.09	415	404	403
1958	41,009	4,389	7,119	8,149	8,078	8,087	5.18	5.12	5.08	422	414	410
1959	42,618	6,303	9,694	8,119	8,130	8,117	5.16	5.10	5.06	419	414	411
1960	45,241	7,841	20,594	8,136	8,178	7,923	5.16	5.08	4.97	420	415	394
1961	48,203	8,975	28,231	8,321	8,357	7,940	5.15	5.08	4.93	428	424	392
1962	56,631	10,928	31,197	8,439	8,420	8,030	5.14	5.09	4.95	434	429	397
1963	55,953	11,487	34,570	8,500	8,551	8,111	5.12	5.08	4.94	435	434	400
1964	58,155	11,808	43,063	8,642	8,722	8,322	5.11	5.04	4.92	441	440	409
1965	60,089	11,782	46,434	8,722	8,751	8,426	5.09	5.04	4.91	444	441	414
1966	61,559	10,516	43,925	8,816	8,889	8,580	5.09	5.05	4.91	449	449	421
1967	61,983	10,095	45,258	8,838	8,969	8,715	5.08	5.04	4.91	449	452	428
1968	61,214	9,573	45,762	8,950	9,015	8,867	5.06	5.01	4.91	453	451	435
1969	58,616	10,154	44,416	9,217	9,120	9,043	5.05	4.99	4.91	466	455	444

<sup>1/</sup> Breed of sire and breed of dam reported as Jersey.

TABLE 5 --Averages for all registered and grade Brown Swiss cows, by year, on a 2x, 305-day, M.E. basis

Year of calving	Number of records			Milk yield			Fat percentages			Fat yield		
	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades	Registered	Grades with ID <sup>1/</sup>	All grades
	No.	No.	No.	Lb.	Lb.	Lb.	%	%	%	Lb.	Lb.	Lb.
1954	9,274	220	917	10,496	9,547	9,902	4.00	3.91	3.96	420	373	393
1955	9,321	283	914	10,597	9,918	10,331	3.99	3.86	3.96	423	383	409
1956	9,996	286	895	10,785	9,840	10,419	4.01	3.93	3.98	433	387	415
1957	11,010	396	957	10,827	10,251	10,434	4.03	3.96	4.01	436	406	418
1958	11,702	506	975	11,122	10,593	10,688	4.04	3.96	3.98	449	419	426
1959	13,225	724	1,410	11,073	10,582	10,709	4.04	3.99	4.00	448	423	428
1960	14,221	961	3,382	10,955	10,872	10,604	4.04	4.02	3.99	443	437	423
1961	15,290	1,209	4,947	11,127	11,021	10,697	4.03	4.00	3.97	449	441	425
1962	17,341	1,501	5,759	11,421	11,112	10,851	4.04	4.00	3.98	461	445	432
1963	18,433	1,629	7,009	11,783	11,629	11,288	4.04	3.99	3.97	476	464	448
1964	19,961	1,796	8,831	12,063	11,678	11,484	4.04	3.99	3.95	487	466	454
1965	18,990	1,785	9,198	12,065	11,766	11,525	4.04	4.00	3.95	488	471	456
1966	19,158	1,616	8,585	12,196	12,145	11,734	4.06	4.01	3.95	495	487	463
1967	19,712	1,768	8,996	12,282	12,155	11,896	4.05	4.01	3.95	498	487	470
1968	19,611	1,814	9,157	12,370	12,254	11,938	4.05	4.01	3.94	501	491	471
1969	18,599	1,847	8,552	12,625	12,271	11,972	4.05	3.99	3.94	511	490	472

<sup>1/</sup> Breed of sire and breed of dam reported as Brown Swiss.

TABLE 6 .--Differences between registered Ayrshires and grade Ayrshires with complete parental identification over all lactations, by years

Year of calving	Herds with both grade and registered cows	Registered minus grades					
		Milk yield		Fat percentage		Fat yield	
		Across herds	Within herds	Across herds	Within herds	Across herds	Within herds
	<u>No.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>%</u>	<u>%</u>	<u>Lb.</u>	<u>Lb.</u>
1954	64	523	335	0.02	0.00	23	14
1955	72	712	76	.00	-.00	28	3
1956	72	810	181	.03	.07	35	15
1957	108	801	-40	.02	.00	31	-1
1958	133	867	328	.03	-.00	32	13
1959	171	627	44	.05	-.06	21	-4
1960	184	467	30	.00	-.04	19	-2
1961	180	536	44	.01	-.02	21	0
1962	227	312	121	.00	-.02	12	3
1963	229	340	1	.02	.00	18	0
1964	223	398	48	.01	-.00	18	2
1965	224	256	-72	.00	-.01	9	-4
1966	225	426	116	.00	-.01	17	4
1967	210	424	-24	.00	.01	17	0
1968	194	485	-31	.02	.01	21	-0
1969	173	406	-87	.02	.00	18	-3

TABLE 7 .--Differences between registered Guernseys and grade Guernseys with complete parental identification over all lactations, by years

Year of calving	Herds with both grade and registered cows	Registered minus grades					
		Milk yield		Fat percentage		Fat yield	
		Across herds	Within herds	Across herds	Within herds	Across herds	Within herds
	<u>No.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>%</u>	<u>%</u>	<u>Lb.</u>	<u>Lb.</u>
1954	559	510	-17	0.07	0.02	30	2
1955	636	323	-17	.03	.01	18	1
1956	749	364	-104	.06	.03	22	-3
1957	906	316	-55	.07	.03	21	-0
1958	1,089	404	7	.05	.03	19	3
1959	1,261	452	-65	.04	.01	19	-2
1960	1,280	274	-108	.04	.01	17	-4
1961	1,359	256	-114	.03	.01	15	-5
1962	1,432	261	-107	.05	.03	16	-3
1963	1,404	277	-80	.06	.03	18	-2
1964	1,370	283	-102	.05	.02	19	-3
1965	1,283	361	-112	.04	.03	20	-3
1966	1,169	230	-142	.05	.03	15	-4
1967	1,111	172	-149	.05	.02	13	-5
1968	1,052	174	-96	.07	.02	14	-3
1969	991	284	-138	.06	.01	20	-5

TABLE 8 .--Differences between registered Holsteins and grade  
Holsteins with complete parental identification over  
all lactations, by years

Year of calv- ing	Herds with both grade and registered cows	Registered minus grades					
		Milk yield		Fat percentage		Fat yield	
		Across herds	Within herds	Across herds	Within herds	Across herds	Within herds
	<u>No.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>%</u>	<u>%</u>	<u>Lb.</u>	<u>Lb.</u>
1954	2,236	846	142	0.00	-0.01	30	4
1955	2,518	769	121	.00	-.01	28	3
1956	3,051	628	126	.00	-.02	23	3
1957	4,263	564	156	.01	-.01	20	4
1958	5,679	475	164	.01	-.01	18	4
1959	7,002	452	84	.00	-.01	16	1
1960	7,828	416	28	.01	-.02	16	-1
1961	8,780	448	25	.00	-.01	16	-1
1962	10,047	528	34	.00	-.01	19	-0
1963	11,044	454	28	.01	-.01	17	-0
1964	11,833	463	-3	.00	-.00	17	-1
1965	12,227	521	-30	.00	-.00	19	-2
1966	12,048	475	-32	.00	-.00	17	-2
1967	12,164	352	-62	.01	.00	14	-3
1968	12,014	377	-88	.00	-.01	14	-3
1969	11,824	347	-99	.00	-.01	14	-4

TABLE 9 .--Differences between registered Jerseys and grade Jerseys with complete parental identification over all lactations, by years

Year of calving	Herds with both grade and registered cows	Registered minus grades					
		Milk yield		Fat percentage		Fat yield	
		Across herds	Within herds	Across herds	Within herds	Across herds	Within herds
	<u>No.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>%</u>	<u>%</u>	<u>Lb.</u>	<u>Lb.</u>
1954	306	296	0	0.09	0.05	22	3
1955	363	197	66	.07	.02	15	5
1956	400	249	89	.05	.03	17	7
1957	526	114	9	.06	.00	11	1
1958	645	71	-59	.06	.05	8	1
1959	762	-11	-71	.06	.05	5	1
1960	867	-42	-76	.08	.04	5	-1
1961	905	-36	-47	.07	.02	4	-1
1962	970	19	-21	.05	.02	5	1
1963	955	-51	31	.04	.00	1	2
1964	957	-80	-43	.07	.03	1	-1
1965	951	-29	-64	.05	.02	3	-2
1966	832	-73	-51	.04	.02	0	-0
1967	786	-131	-108	.04	.02	-3	-4
1968	754	-65	-155	.05	.03	2	-5
1969	757	97	-38	.06	.01	11	-0

TABLE 10.--Differences between registered Brown Swiss and grade Brown Swiss with complete parental identification over all lactations, by years

Year of calving	Herds with both grade and registered cows	Registered minus grades					
		Milk yield		Fat percentage		Fat yield	
		Across herds	Within herds	Across herds	Within herds	Across herds	Within herds
	<u>No.</u>	<u>Lb.</u>	<u>Lb.</u>	<u>%</u>	<u>%</u>	<u>Lb.</u>	<u>Lb.</u>
1954	65	949	209	0.09	-0.02	47	7
1955	72	679	66	.13	.04	40	7
1956	71	945	176	.08	-.02	46	6
1957	91	576	82	.07	-.00	30	3
1958	126	529	69	.08	.01	30	4
1959	159	491	66	.05	-.04	25	-1
1960	183	83	-60	.02	-.02	6	-4
1961	226	106	-205	.03	-.01	8	-8
1962	250	309	96	.04	.03	16	6
1963	258	154	76	.05	.02	12	5
1964	263	385	220	.05	.01	21	10
1965	275	299	-56	.04	.02	17	0
1966	257	51	-196	.05	.04	8	-3
1967	248	127	-261	.04	.02	11	-7
1968	248	116	-359	.04	.03	10	-11
1969	258	354	-332	.06	.03	21	-10



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